

CLAIMS:

1. A fuel cell comprising:

a fuel cell main unit which includes a fuel electrode and an oxidant electrode, and generates electric power
5 based on supplying of organic liquid fuel to said fuel electrode and oxidant to said oxidant electrode;

a fuel holder which stores said organic liquid fuel and supplies said organic liquid fuel to said fuel electrode; and

10 a transforming section which transforms said organic liquid fuel into vapor or mist,

wherein said fuel holder supplies said vapor or said mist of said organic liquid fuel to said fuel electrode.

15 2. The fuel cell according to claim 1, further comprising:

a controller which control said transforming section based on an output of said fuel cell main unit.

20 3. The fuel cell according to claim 1 or 2, wherein said organic liquid fuel includes a plurality of compounds, said fuel holder includes a plurality of sub fuel holders, each of which stores corresponding one of said plurality of compounds, and

25 said transforming section includes a plurality of sub transforming section, each of which transforms corresponds one of said plurality of compounds into vapor

or mist.

4. The fuel cell according to any of claims 1 to 3,
wherein said transforming section transforms said organic
5 liquid fuel into mist by vibrating said organic liquid
fuel.

5. The fuel cell according to claim 4, wherein said
transforming section includes a supersonic vibration type
10 atomizing apparatus.

6. The fuel cell according to claim 5, wherein said
supersonic vibration type atomizing apparatus includes a
piezoelectric vibrator.

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7. The fuel cell according to any of claims 1 to 3,
wherein said transforming section transforms said organic
liquid fuel into vapor by heating said organic liquid fuel.

20 8. The fuel cell according to claim 7, wherein said
transforming section includes a heating apparatus.

9. The fuel cell according to any of claims 1 to 8,
wherein said fuel cell main unit further includes:

25 a fuel path which is arranged on a side of said fuel
electrode, and is a path that said organic liquid fuel
supplied from said fuel holder flows thorough to said fuel

electrode; and

a permeation membrane which is arranged on a wall of said fuel path, and permeates carbon dioxide generated at said fuel electrode.

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10. A portable electric device comprising:

a fuel cell; and

a portable electric device body to which electric power is supplied from said fuel cell,

10 wherein said fuel cell including:

a fuel cell main unit which includes a fuel electrode and an oxidant electrode, and generates electric power based on supplying of organic liquid fuel to said fuel electrode and oxidant to said oxidant electrode;

15 a fuel holder which stores said organic liquid fuel and supplies said organic liquid fuel to said fuel electrode; and

a transforming section which transforms said organic liquid fuel into vapor or mist,

20 wherein said fuel holder supplies said vapor or said mist of said organic liquid fuel to said fuel electrode.

11. The portable electric device according to claim 10, wherein said fuel cell further including:

25 a controller which control said transforming section based on an output of said fuel cell main unit.

12. The portable electric device according to claim 10 or 11, wherein said organic liquid fuel includes a plurality of compounds,

5 said fuel holder includes a plurality of sub fuel holders, each of which stores corresponding one of said plurality of compounds, and

said transforming section includes a plurality of sub transforming section, each of which transforms corresponds one of said plurality of compounds into vapor or mist.

13. The portable electric device according to any of claims 10 to 12, wherein said transforming section transforms said organic liquid fuel into mist by vibrating said organic liquid fuel.

14. The portable electric device according to claim 13, wherein said transforming section includes a supersonic vibration type atomizing apparatus.

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15. The portable electric device according to claim 14, wherein said supersonic vibration type atomizing apparatus includes a piezoelectric vibrator.

25 16. The portable electric device according to any of claims 10 to 12, wherein said transforming section transforms said organic liquid fuel into vapor by heating

said organic liquid fuel.

17. The portable electric device according to claim 7,
wherein said transforming section includes a heating
5 apparatus.

18. The portable electric device according to any of
claims 10 to 17, wherein said fuel cell main unit further
includes:

10 a fuel path which is arranged on a side of said fuel
electrode, and is a path that said organic liquid fuel
supplied from said fuel holder flows thorough to said fuel
electrode; and

a permeation membrane which is arranged on a wall of
15 said fuel path, and permeates carbon dioxide generated at
said fuel electrode.

19. A operation method of a fuel cell, comprising:

(a) generating electric power by supplying organic
20 liquid fuel to a fuel electrode and oxidant to an oxidant
electrode of a fuel cell; and

(b) supplying said organic liquid fuel to a fuel
electrode by transforming said organic liquid fuel into
mist or vapor.

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20. The operation method of a fuel cell according to claim
19, wherein said organic liquid fuel includes a plurality

of compounds,

said step (b) includes:

(b1) controlling supplying amounts of said plurality of compounds based on an output power of said fuel cell.

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21. The operation method of a fuel cell according to claim 19 or 20, wherein said step (b) includes:

(b2) transforming said organic liquid fuel into mist by vibrating said organic liquid fuel.

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22. The operation method of a fuel cell according to claim 19 or 20, wherein said step (b) includes:

(b3) transforming said organic liquid fuel into vapor by heating said organic liquid fuel.